**Eleventh International Workshop on
High-Level Parallel Programming Models and
Supportive Environments**

HIPS 2006

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Preface

HIPS'06, held in conjunction with the 20th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2006) in Rhodes Island, Greece, was the eleventh in a series of workshops on High-Level Parallel Programming Models and Supportive Environments. It provided a forum for researchers in the areas of applications, computational models, language design, compilers, system architecture, and programming tools to discuss new developments in programming parallel and grid systems.

One of the keys for a (commercial) breakthrough of parallel processing and grid computing are techniques that facilitate efficient usage of such environments. This covers, for example, programming languages, programming tools, system middleware, as well as communication libraries. These techniques have to be integrated to provide a full solution to the problem. This integration is the topic HIPS is devoted to. Contributions, for example, present new performance analysis tools that are closely linked to the programming model, supportive tools for workflow programming on Grids, or the integration of languages for service-level agreements with grid applications and resource brokers.

We selected ten high-quality papers for presentation at the one-day workshop and for publication in these proceedings.

Thomas Fahringer gave an invited presentation in Session 1 on a sophisticated Grid workflow development and computing environment.

Session 2 covered three contributions in the field of performance analysis. They presented concepts for improving the scalability of performance tools, for standardizing interfaces of performance monitors of parallel systems, and a universal client for Grid monitoring systems.

Session 3 was devoted to techniques for programming message passing systems. It covered high-level programming interfaces for applications on Grids, a middleware for running and managing parallel distributed mobile Java applications, as well as techniques for efficient implementation of MPI.

In Session 4 new parallel languages and compiler techniques were presented. The iterator concept of Chapel was introduced in the first presentation. The second covered automatic code generation for distributed memory architectures based on the polytope model. An implementation technique for threadprivate data structures in OpenMP and a configurable framework for stream programming were presented in the last two presentations.

In summary, the diverse collection of papers made up for an interesting and stimulating workshop and once again provided evidence that high-level parallel programming is still a widely open and active research topic. Thus, this series of workshops will certainly be continued in the years to come.

We thank all the researchers for their contributions to the workshop and the Program Committee members and reviewers for their time and expertise, which helped to make HIPS'06 become reality and a successful event. We would like to thank the organizers of the 20th IEEE International Parallel and Distributed Processing Symposium for inviting us to organize the workshop and for taking care of the local arrangements.

Michael Gerndt, Workshop Chair

Technische Universität München (Germany)

Workshop Chair

Michael Gerndt   Technische Universität München, Germany

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Towards a Sophisticated Grid Workflow Development and Computing Environment
(Invited Talk)

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While Grid infrastructures can provide massive compute and data storage power, it is still an art to effectively harness the power of Grid computing. Current application development for Grid commonly requires the programmer to deal with many low level and complex details such as selecting software components on specific Grid computers, mapping applications onto the Grid, explicitly specify data transfer operations, etc.

In this talk we will present the ASKALON environment whose goal is to create an invisible Grid for both Grid users and application developers. ASKALON is centered around a set of high-level services for transparent and effective Grid access, including a Scheduler for optimized mapping of workflows onto the Grid, an Enactment Engine for reliable application execution, a Resource Manager covering both computers and application components, and a Performance Prediction and Analysis service based on a traing phase, analytical models and dynamic measurements. A sophisticated XML-based programming interface that shields the user form the Grid middleware details, allows the high-level composition of workflow applications. ASKALON is used to develop and port scientific applications as workflows in the Austrian Grid. Experimental results using several real-world scientific applications to demonstrate the effectiveness of ASKALON will be demonstrated.